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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/827,074	04/19/2004	Tomoki Nobuta	WAKAB76.006AUS	1881

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EXAMINER

YUAN, DAH WEI D

ART UNIT	PAPER NUMBER
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1745

NOTIFICATION DATE	DELIVERY MODE
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07/31/2007

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary

Application No.

10/827,074

Applicant(s)

NOBUTA ET AL.

Examiner

Dah-Wei D. Yuan

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 May 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2 and 4-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2 and 4-19 is/are rejected.
- 7) ☒ Claim(s) 20 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 06262007.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date: _____.
- ☐ Notice of Informal Patent Application
- ☐ Other: _____.

**ELECTRODE FOR ELECTROCHEMICAL CELL
AND ELECTROCHEMICAL CELL THEREWITH**

Examiner: Yuan

S.N. 10/827,074

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July 25, 2007

Detailed Action

1. The Applicant's amendment filed on May 14, 2007 was received. The specification was amended. Claim 3 was cancelled. Claim 1 was amended. Claim 20 was added.
2. The text of those sections of Title 35, U.S.C. code not included in this action can be found in the prior Office Action issued on February 12, 2007.

Claim Rejections - 35 USC § 102

3. The claim rejections under 35 U.S.C. 102(b) as anticipated by Fleischer et al. on claims 1,2,7-19 are withdrawn, because the independent 1 has been amended.

Claim Rejections - 35 USC § 103

4. Claims 1,2,4-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fleischer et al. (US 6,225,009 B1) in view of Yoshioka et al. (US 4,693,828).

Fleischer et al. disclose an electrochemical cell comprising an anode and a cathode (column 2, lines 60-61). The anode includes an organic compound which is a source of proton during discharge and the cathode includes a compound which forms an electrochemical battery couple with the anode (column 2, lines 62-64 and column 10, lines 21-55). For example, Fleisher et al. disclose the organic compound in the anode can be quinone (column 3, line 3) and

the anode active component is capable of providing hydrogen ions in an electrochemical reaction to produce electrical energy during discharge of the cell and to accept hydrogen ions during charging of the cell (column 3, lines 8-12). Fleischer et al. disclose that organic materials are used as a hydrogen ion source in the solid state and the hydrogen ions of the redox reaction are transported in a non-liquid electrolyte (column 4, lines 65-67). Fleischer et al. disclose that both the anode and/or cathode include a proton conducting material which may be a solid gel, a polymer, or an aqueous solution such as sulfuric acid (column 5, lines 54-56). Fleischer et al. disclose an anion exchange material in the form of a sheet or resin, is mixed with the materials of the cathode or anode mix or alternatively is positioned between the anode and the cathode; and that exchange material is a natural or synthetic substance (column 12, lines 1-8). Hexahydroxy benzene can be used in the form of triquinoyl in the cathode with coupled with an appropriate anodic active material (column 13, lines 20-22). Fleischer et al. disclose a three cell bipolar battery (stacked cells) with graphite sheets between the cells acting as bipolar current collector (column 18 line 58 to column 19, line 3). Fleischer et al. disclose that the graphite sheets between the cells act as bipolar a current collector which shows that the batteries are stacked and connected in series. Each individual cell voltage is 0.55 volt and stacking 3 in series gives 1.7 volts (column 19, lines 1-6).

However, Fleischer et al. do not teach the anion exchange resin is a fiber. Yoshioka et al. teach ion exchange resin fibers with the anion-exchanges groups such as a quaternary ammonium group and a primary, secondary, and tertiary amino groups (column 1, lines 65-67). The ion-exchange resin resins are produced by introducing ion-exchange groups to a styrene-

divinyl benzene copolymer with a high chemical resistance and heat resistance. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include the polyvinyl-alcohol based anion-exchange resin fibers with quaternary ammonium groups in the electrode of Fleischer, because Yoshioka et al. teach the use of fibrous ion exchange resin to increase chemical and thermal resistance.

Furthermore, Yoshioka et al. teach that known ion-exchange fibers used are usually 0.1 to 100 μm and preferably 1 to 100 μm in diameter (column 2, lines 4-5) and include polyvinyl alcohol-based fibers (column 2, line 10). In Example 1, Yoshioka et al. teach that the fibers are cut to a length of 1 mm (column 4, line 55).

Allowable Subject Matter

5. Claim 20 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claim 20 would be allowable because the prior art does not disclose or suggest the electrolyte is an aqueous solution containing a proton-ionizing electrolyte.

Response to Arguments

6. Applicant's arguments filed on May 14, 2007 have been fully considered but they are not persuasive.

Applicant's principal arguments are

- (a) *None of the discussion in Yoshioka et al. is concerning the function of an electrode;*
- (b) *cycle-life properties and high speed charge/discharge properties are significantly improved when the anion-exchange fiber is added (see Examples 1 and 7 verse Example 10).*

In response to Applicant's arguments, please consider the following comments.

(a) As discussed in the Office Action above, the fibrous ion exchange resin has high chemical resistance and heat resistance. Incidentally, the instant specification also discloses the evaluation of the resulting electrode by using a high temperature cycle test at 45°C. Better high temperature cycle properties, including initial and remaining capacities, were observed with the addition of fibrous ion exchange resin. See pages 31-35. The court has held that the selection of a known material based on its suitability for its intended use supported a *prima facie* obviousness determination. *In re Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945);

(b) Table 1 in the instant specification lists the capacity and capacity remaining rate for various batteries, which comprise ion exchange resin in the electrode. It is noted that the electrochemical properties in Examples 3, 4 and 5 are comparable to those in Example 10, wherein fibrous ion exchange resin is used in all Examples 1, 3, 4 and 5. The applicant has yet established the differences in results that are in fact unexpected and unobvious and of both statistical and practical significance. The burden is on applicant to establish result that are unexpected and significant by adding anion-exchange resin fibers in the composition. See MPEP 716.02(a) and (b).

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dah-Wei D. Yuan whose telephone number is (571) 272-1295. The examiner can normally be reached on Monday-Friday (8:00-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan, can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

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applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Dah-Wei D. Yuan
July 25, 2007



DAH-WEI YUAN
PRIMARY EXAMINER